Beautiful Idea:

BIO – ALGEBRA. A Math Workbook to Accompany Biology Courses

Co-Developers:

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Project Description:

An objective of the project is development of a workbook containing mathematical problems typical for introductory Biology courses (BIO 110, BIO130). The goal is to make Biology students acquainted with elementary mathematical methods use in Biology for solution of subject – related problems. The problems will present the subject in a way that clearly demonstrates how mathematical problems appear, how they may be solved, and how the obtained results may be interpreted.

The workbook will comprise several sections, corresponding to one Biology topic each. The section will be opened with some statements of Biological problems leading to the formulation of quantitative problems. Then one problem of each type will be solved to demonstrate the appropriate approach. In the following part of a section a series of similar problems students will be suggested aimed to be solved either independently or under the guide of a professor. Answer key will be provided at the end of the workbook.

The following topics will be included (the list is tentative and subject to revision during the project development): Understanding charts; Graphs of functions; Graphs: classification trees and networks; Exponential growth and decay; Genetics and probability; Correlation and regression (Excel – based); Hypotheses testing (Excel – based); Optimization problems (Parabolas with real zeroes); Logarithmic scale.

Each topic will include an opening problem and 5 - 10 problems for work. The format of the workbook assumes student's work directly inside the workbook on the space provided. The workbook eliminates the need in scrap paper or answer sheet.

Goals and Anticipated Outcomes

The main goal is to make Biology students (BIO 110, BIO130) acquainted with elementary mathematical methods use in Biology for solution of subject – related problems.

An objective to achieve this goal is development of a workbook containing mathematics problems typical for introductory Biology courses.

Outcome of the project is a workbook containing mathematics problems typical for introductory Biology courses (BIO 110, BIO130).

Support in the Literature

Timeline for Implementation

Upon the grant approval:

- Development of a pilot version of the workbook

Fall 2010
- Revision of the pilot version and final version preparation

Spring 2011
- The workbook will be used in one of the Biology courses in Hostos as an experimental supplement in Fall 2011.